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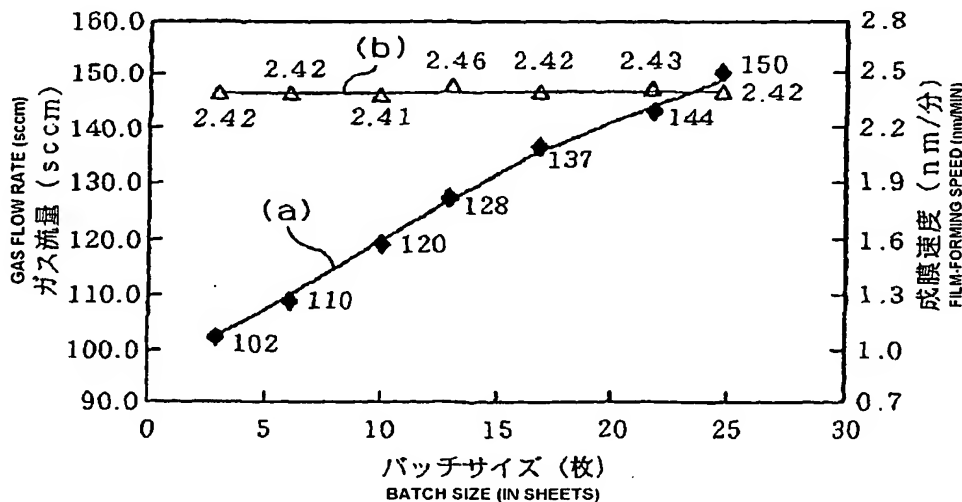
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[続葉有]

(54) Title: HEAT TREATING SYSTEM AND HEAT TREATING METHOD

(54) 発明の名称: 熱処理装置及び熱処理方法



(57) Abstract: A heat treating system comprising a holding unit for holding a plurality of substrates, a reaction container into which the holding unit is carried, a treating gas supply mechanism for supplying a treating gas into the reaction container, and a heating mechanism for heating the reaction container when the treating gas is supplied to perform a film-forming processing on the substrates. Flow-rate parameter table data in which data on the number of substrates scheduled for treating in one batch is allowed to correspond to the target value data of the treating gas flow-rate parameters is stored in a flow-rate parameter table data storing unit. A control means obtains the target value data of the treating gas flow-rate parameters according to an actual number of substrates scheduled for treating in one batch and based on flow-rate parameter table data stored in the flow-rate parameter table data storing unit, and controls the treating gas supply mechanism according to the target value data. The target value data of the flow-rate parameters is so determined as to provide a uniform film-forming speed to treating batches in which the number of substrate scheduled for treating differs from one another.

(57) 要約: 本発明の熱処理装置は、複数の基板を保持する保持具と、前記保持具が搬入される反応容器と、前記反応容器に処理ガスを供給する処理ガス供給機構と、前記処理ガスの供給時に前記反応容器を加熱して基板に成膜処理を

[続葉有]

Translation

PATENT COOPERATION TREATY

PCT/JP2003/013849



PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

|   |  |  |
|---|--|--|
| Applicant's or agent's file reference<br>144971-077   | FOR FURTHER ACTION<br>See Form PCT/IPEA/416                                |  |
| International application No.<br>PCT/JP2003/013849  | International filing date (day/month/year)<br>29 October 2003 (29.10.2003) | Priority date (day/month/year)<br>30 October 2002 (30.10.2002) |
| International Patent Classification (IPC) or national classification and IPC<br>H01L 21/205, C23C 16/52 |  |  |
| Applicant<br>TOKYO ELECTRON LIMITED   |  |  |

|  |  |
|--|--|
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>4</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> |  |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>   |  |

|  |   |
|--|---|
| Date of submission of the demand<br>05 April 2004 (05.04.2004) | Date of completion of this report<br>01 September 2004 (01.09.2004) |
| Name and mailing address of the IPEA/JP                        | Authorized officer  |
| Facsimile No.  | Telephone No.   |

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2003/013849

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is language of a translation furnished for the purpose of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☒ The international application as originally filed/furnished
- ☐ the description:
- pages \_\_\_\_\_, as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
- pages \_\_\_\_\_, as originally filed/furnished
- pages\* \_\_\_\_\_, as amended (together with any statement) under Article 19
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- pages \_\_\_\_\_, as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP03/13849

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

|                               |        |      |     |
|-------------------------------|--------|------|-----|
| Novelty (N)                   | Claims | 1-12 | YES |
|                               | Claims |      | NO  |
| Inventive step (IS)           | Claims |      | YES |
|                               | Claims | 1-12 | NO  |
| Industrial applicability (IA) | Claims | 1-12 | YES |
|                               | Claims |      | NO  |

## 2. Citations and explanations (Rule 70.7)

## Claims 1, 3-10 and 12

Document 1: JP, 2001-144019, A (Tokyo Electron Limited)

May 25, 2001 (05.25.01), Paragraphs 0008-0029, Figs. 1-6

Document 1 describes a film-forming device comprising a holding unit holding a plurality of substrates, a reaction container into which the holding unit, a treating gas supply mechanism that supplies a treating gas to the reaction container, and a heating mechanism that performs a film-forming processing on the substrate by heating the reaction container at the time of supplying a treating gas, wherein a flow-rate parameter table that corresponds data of the number of substrates to be treated in one batch with target value data of the flow-rate parameter for a treating gas is measured in advance, control is performed by a flow-rate parameter table that stores such data, a heat treating device having control means for controlling the flow rate of gas based on parameter data, and by temperature table data, and control is performed according to the actual number of embedded wafers.

Document 2: JP, 2000-340554, A (Tokyo Electron Limited)

December 8, 2000 (12.08.00)

Paragraphs 0009-0026, Figs. 1-9 (A)(B)

Document 2 describes technology for controlling film-forming parameters so as to set the same film-forming rate to be roughly the same as that of the standard process.

Controlling by focusing on the film-forming rate as described in document 2 in order to improve reproducibility of the process in the invention described in document 1 would be obvious to a party skilled in the art.

## Claims 2 and 11

Claims 2 and 11 set a parameter that is the difference between a minimum value and maximum value when an average film thickness of a thin film to be coated on the substrate by each batch treatment is divided by treatment time at 0.05nm/min. However, determining a value to set for such parameter would be necessarily arrived at by a party skilled in the art. Therefore, claims 2 and 11 could be easily conceived of by a party skilled in the art based on documents 1 and 2.

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP03/13849

## Box No. VI Certain documents cited

### 1. Certain published documents (Rule 70.10)

| Application No.<br>Patent No. | Publication date<br>(day/month/year) | Filing date<br>(day/month/year) | Priority date (valid claim)<br>(day/month/year) |
|-------------------------------|--------------------------------------|---------------------------------|---|
| JP 2003-77782 A<br>[E,X]      | 14.03.2003                           | 31.08.2001                      |   |

### 2. Non-written disclosures (Rule 70.9)

| Kind of non-written disclosure | Date of non-written disclosure<br>(day/month/year) | Date of written disclosure<br>referring to non-written disclosure<br>(day/month/year) |
|--------------------------------|--|---|
|                                |  |   |